

WHAT IS CLAIMED IS:

1. A gas turbine comprising a compressor for compressing air, a combustor for mixing air compressed  
5 by said compressor with fuel and burning them, and a turbine to be driven by combustion gas burned by said combustor;  
said gas turbine further comprising;  
a cooling air system for supplying part of air  
10 compressed by said compressor to the high temperature section of said turbine;  
a heater exchanger for exchanging heat of part of air compressed by said compressor, said exchanger installed on said cooling air system; and  
15 a system for adjusting air temperature on the downstream side of said heater exchanger in conformity to the operation time of said turbine.
2. A gas turbine comprising a compressor for  
20 compressing air, a combustor for mixing air compressed by said compressor with fuel and burning them, and a turbine to be driven by combustion gas burned by said combustor;  
said gas turbine further comprising;  
25 a cooling air system for supplying part of air compressed by said compressor to the high temperature section of said turbine;

a heater exchanger for exchanging heat of part of  
air compressed by said compressor, wherein said  
exchanger installed on said cooling air system is an  
indirect heater exchanger equipped with a coolant feed  
5 unit for feeding coolant; and

coolant temperature adjusting means for adjusting  
the temperature of said coolant of said heater  
exchanger.

10 3. A gas turbine comprising a compressor for  
compressing air, a combustor for mixing air compressed  
by said compressor with fuel and burning them, and a  
turbine to be driven by combustion gas burned by said  
combustor;

15 said gas turbine further comprising;  
a cooling air system for supplying part of air  
compressed by said compressor to the high temperature  
section of said turbine, and for supplying to the  
combustor the air having cooled the high temperature  
20 section of said turbine,

a heater exchanger for exchanging heat of part of  
air compressed by said compressor and a coolant system  
boost compressor for compressing air between said  
heater exchanger and said turbine high temperature  
25 section, wherein said heater exchanger and booster  
compressor are installed on said cooling air system,  
and

a system for adjusting air temperature on the downstream side of said heater exchanger in conformity to the operation time of said turbine.

5           4. A gas turbine according to any one of Claims 1 through 3 further characterized by comprising an auxiliary boiler or heater for overheating the coolant of said heater exchanger.

10           5. A gas turbine according to any one of Claims 1 through 3 further characterized by comprising;  
            an auxiliary boiler for overheating the coolant of an evaporator wherein said heat exchanger is used as said evaporator,  
15           a heater for overheating the coolant of said evaporator or  
            a controller for controlling the water level for said evaporator.

20           6. A gas turbine comprising a compressor for compressing air, a combustor for mixing air compressed by said compressor with fuel and burning them, and a turbine to be driven by combustion gas burned by said combustor;  
25           said gas turbine further comprising;  
            a cooling air system for supplying part of air compressed by said compressor to the high temperature

section of said turbine;

a heater exchanger for exchanging heat of part of  
air compressed by said compressor, said exchanger  
installed on said cooling air system; and

5 a bypass system for bypassing said heater  
exchanger.

7. A high temperature section cooling method of a  
gas turbine comprising a compressor for compressing  
10 air, a combustor for mixing air compressed by said  
compressor with fuel and burning them, and a turbine  
to be driven by combustion gas burned by said  
combustor;

said high temperature section cooling method  
15 comprising the steps of:

cooling part of air compressed by said compressor  
by said heat exchanger and supplying it to the high  
temperature section of said turbine, and

adjusting said air temperature at a desired time  
20 during the operation of said turbine in order to avoid  
overheating of air on the downstream side of said  
heater exchanger.

8. A high temperature section cooling method of a  
25 gas turbine comprising a compressor for compressing  
air, a combustor for mixing air compressed by said  
compressor with fuel and burning them, and a turbine

to be driven by combustion gas burned by said combustor;

said gas turbine further comprising:

5 a cooling air system for cooling part of air compressed by said compressor and sending it to the high temperature section of said turbine, and

a bypass system for bypassing said heater exchanger;

10 said high temperature section cooling method further characterized by comprising a step of:

sending at least part of air to said bypass system at a desired time during the operation of said turbine, and

15 adjusting said air temperature in order to avoid overheating of air on the downstream side of said heater exchanger.